

History of the Atom

B.C. – Democritus develops _____

- he pounded up materials in his pestle and mortar until he had reduced them to smaller and smaller particles which he called _____
- "atom" comes from the Greek word _____ which means unable to be cut or divided; _____

8 – John Dalton - _____

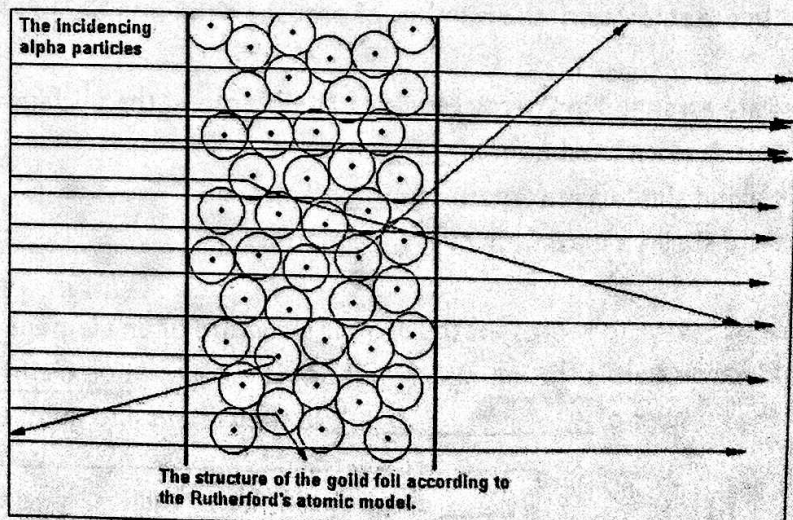
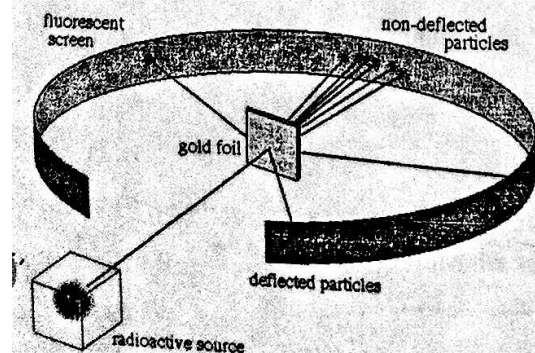
- suggested that all matter was made up of tiny spheres that were able to bounce around with perfect elasticity and called them _____
- Said all atoms of a given element are _____ and atoms of different elements could join to form _____
- _____ – chemical compounds always contain the same elements in the exact same proportions by weight or mass

18 – Joseph John Thompson - _____

- found that atoms could sometimes eject a far smaller negative particle which he called an _____
- His experiment revealed that _____ could be _____ into smaller parts
- 1904 - Thompson develops the idea that an atom was made up of _____ scattered unevenly within an elastic sphere surrounded by a soup of _____ charges to balance the electron's charge like plums surrounded by pudding
- Called this model: Plum Pudding Model

10 – Ernest Rutherford

- Developed an experiment to test Thomson's model
- oversaw Geiger and Marsden (his students) carrying out his famous experiment.
- they fired Helium nuclei (_____) at a piece of _____ foil which was only a few atoms thick.
- they found that although most of them passed through. About 1 in 10,000 hit and _____
- They found that while most of the helium nuclei passed through the foil, a small number were deflected and, to their surprise, some helium nuclei bounced straight back.

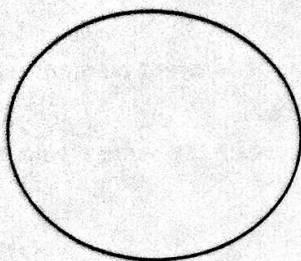


- Rutherford's new evidence allowed him to propose a more detailed model with a _____
- He suggested that the _____ was all in a central nucleus. With this holding the electrons in place by electrical _____

1913 - Niels Bohr

- Studied under Rutherford at the _____ in Manchester.
- Bohr refined Rutherford's idea by adding that the electrons were in _____. Rather like planets orbiting the sun. With each orbit only able to contain a _____

Draw AND label the Example of the Helium Atom:



Particle	Charge	Mass

ATOMIC STRUCTURE

He

4

Atomic Mass (Mass _____) - the number of _____ and _____ in an atom

2

Atomic Number - the number of _____ in an atom

*In a stable Atom, the number of protons = the number of electrons

Electrons are arranged in Energy Levels or Shells around the nucleus of an atom.

- first shell - a maximum of _____ electrons
- second shell - a maximum of _____ electrons
- third shell - a maximum of _____ electrons

There are two ways to represent the atomic structure of an element or compound

- **Electron Configuration** - With electronic configuration elements are represented _____ by the number of _____ in their shells and number of shells. For example: Nitrogen → 2, 5

N
14
7

_____ electrons in the 1st shell
_____ electrons in the 2nd shell

Write the number of protons, neutrons, electrons and the electron configuration for the following elements:

a. Ca

Protons _____

Electrons _____

Neutrons _____

Electron configuration _____

b. Na

Protons _____

Electrons _____

Neutrons _____

Electron Configuration _____

c. O

Protons _____

Electrons _____

Neutrons _____

Electron configuration _____

d. Cl

Protons _____

Electrons _____

Neutrons _____

Electron configuration _____

e. Si

Protons _____

Electrons _____

Neutrons _____

Electron Configuration _____

f. B

Protons _____

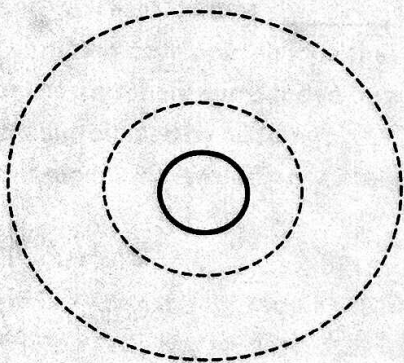
Electrons _____

Neutrons _____

Electron configuration _____

Bohr Model and Cross Diagram

- With Louis Dot & Cross diagrams _____ and compounds are represented by Dots or Crosses to show _____, and _____ to show the shells.
- Draw the Diagram for an atom of Nitrogen



- Draw the Bohr model for Oxygen and Chlorine

Isotopes – two elements with the same number of _____ but a different number of _____

Examples of Isotopes of Carbon:

C

C